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FOREST INSECT INVESTIGATIONS

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FOREST INSECT SURVEY - SEASON OF 1943

INYO NATIONAL FOREST, CALIFORNIA

by

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Berkeley 4, California
March 25, 1944

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U. S. Department of Agriculture
Bureau of Entomology and Plant Quarantine
Forest Insect Investigations

FOREST INSECT SURVEY - SEASON OF 1943

INYO NATIONAL FOREST, CALIFORNIA

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March 25, 1944

ABSTRACT OF RESULTS

A. The Reporting Area:

1. Total acreage — 443,000 acres
   - a. Commercial pine stands — 50,000 acres
   - b. Recreational areas — 12,000 acres
   - c. Alpine types — 21,000 acres
   - d. Open ranges — 360,000 acres

2. Volume of pine timber — Unknown

B. The 1942 infestation (complete record)

1. Total pine timber killed on reporting area (Tables 4 and 5)
   - a. Jeffrey pine - Number of trees 365; Volume 300,000 b.f.
   - b. Lodgepole pine - Number of trees 165; Volume 35,000 b.f.

2. Classification of infestation: low endemic

3. Primary insects: Jeffrey pine beetle in Jeffrey pine
   Emarginate engraver beetle in Jeffrey pine
   California flathead in Jeffrey pine
   Mountain pine beetle in lodgepole pine
   Great Basin tent caterpillar on range browse

4. Trend of infestation: static, slight decrease from 1941

C. The 1943 infestation (partial record)

1. Primary insects: same as in 1942 infestation

2. Probable trend: no increase over 1942

3. Control recommended: none

INTRODUCTION

The 1943 forest insect survey of parts of the Inyo National Forest was made by John E. Patterson of the Forest Insect Laboratory, Bureau of Entomology and Plant Quarantine, Berkeley, California, during the period September 22 to 27, 1943. This survey is a part of the annual regional survey made to determine the extent of insect damage to timber stands and range browse. The sections of the forest examined included all the merchantable timber stands and recreational areas of the Mammoth Ranger District and the open range lands eastward to Benton.

The estimates of insect-caused damage which are given in the text are based primarily upon data secured from sample plot cruises and roadside strip measurements. These data were modified by extensive counts of faded trees and special examinations made on recreational areas.

REPORTING AREA

In previous reports on surveys conducted in this forest, no attempt was made to group the individual timber stands into areas of similar characteristics; rather they were all included in one general area corresponding to the Mammoth District. This arrangement did not permit reporting local conditions with respect to the particular part of the area where they existed, and for this reason was not entirely satisfactory.

Beginning with this report the Mammoth District of the Inyo has been divided into seven entomological units of definite characteristics which conform rather closely to local conditions. This adjustment has largely disposed of the defects of the previous system and permits a more logical recording of insect damage.

The present organization is shown in Table 1 which also includes a summary of timbered acreage and stand composition for each unit. No attempt has been made to show volume figures since data on stocking are not available at this time.

These units can be grouped into four general classes: (1) commercial forests in Crestview, Glass Creek, Casa Diablo, Mammoth Lakes and Chidago, (2) recreational stands of mixed species on Glass Creek and Mammoth Lakes, (3) high altitude non-merchantable forests on Casa Diablo, Glass Creek, Sagehen and Magee Meadows and (4) browse cover on open ranges.

Table 1. Timbered acreage of principal forest types in Mammoth reporting area by entomological units.

Reporting area	Entomological Unit Name	Timbered acreage	Principal forest type
Mammoth	Crestview	11,500	JP-WF
	Glass Creek	11,500	JP-WF-LP
	Casa Diablo	16,000	JP-WF-LP
	Mammoth Lakes	14,000	JP-WF-LP
	Sagehen Meadows	9,500	LP-WF
	Magee Meadows	13,000	SP-WF
	Chidago	7,500	JP-Pinon
	Total	83,000	
	Open range	360,000	(Non-timbered, Purshia and Ribes)
	TOTAL ACREAGE	443,000	

1. Commercial forests. The commercial forests approximate 50,000 acres. Jeffrey pine is the principal species and the stands are composed largely of mature and overmature trees. The primary insect problems at the present time are connected mainly with Jeffrey pine which is the only tree species of commercial importance. The insect hazard in these stands is high. Epidemic conditions have occurred in past years and may be expected to develop again in future years.

2. Recreational forests. Timber stands on the recreational areas total about 12,000 acres. They are composed of Jeffrey pine, lodgepole pine, white pine, and white and red fir. Compared with the commercial forests these stands do not rate highly in stumpage value, but they are of almost equal importance in community value although more local in extent. Here all species are considered important and the insect problem is varied, although in the past it has been chiefly concerned with lodgepole and white pine. Because of the large number of mature and overmature trees, which are highly susceptible to insect attack, the hazard is equally as great as in the commercial forests.

3. Non-merchantable forests. These stands of secondary importance comprise roughly about 21,000 acres of the high altitude regions. They are composed largely of the alpine species white and red fir and lodgepole pine. Epidemic infestations of recent years have decimated these stands over large areas, taking a heavy toll from all age groups. The epidemic of Oslar's tussock moth was widespread during the years 1934 to 1938 in white fir, killing trees of all sizes. Coincidental with this epidemic and correlated with it was a concentration of the fir engraver beetle, Scolytus ventralis, on areas defoliated by the tussock moth. It was responsible for killing many defoliated trees that otherwise might have survived. The lodgepole pine forests are subject to periodic epidemics of a needleminer, Recurvaria sp., and the mountain pine beetle. In recent years each of these insects developed to epidemic proportions in lodgepole stands in Sagehen and Magee meadow units.

4. Open stock ranges. The open stock ranges are extensive, aggregating about 360,000 acres, and include all the non-timbered areas of the reporting district. Insect problems on these ranges have been acute in past years and may be expected to develop again in the future. They are concerned chiefly with the Great Basin tent caterpillar which causes widespread damage to browse, principally bitter brush and wild gooseberry. While browse infestations are generally outside the scope of forest entomology, the Berkeley laboratory has included the affected ranges as a part of the survey area and has annually reported current conditions found on them.

Due to the complexity of the insect situation on the reporting area where commercial values and recreational and range assets are equally involved, the problem of protection against insect damage and losses is threefold in demanding the attention that should be given it.

RESULTS OF THE SURVEY

Character of infestations and insects responsible.

The Jeffrey pine beetle, Dendroctonus jeffreyi Hopk., and the emarginate engraver beetle, Ips emarginatus Lec., were the two principal insects responsible for losses in Jeffrey pine. The California flathead, Melanophila californica Van D., was associated with these beetles in some attacks, but was not generally present. During 1942 and 1943 attacks were made only on single trees, generally mature and overmature specimens, and usually some distance from other attacked trees. No group attacks were found and because of this characteristic, the infestations were widely scattered. Insect conditions in Jeffrey pine generally over the reporting area have remained in an endemic status in all stands. This condition was particularly evident on the recreational areas where infestations were scarcely noticeable. Although the loss record for 1943 is only about 75 percent complete, because of late seasonal attacks which were not visible at the time the survey was made, it is evident that the year's losses will not exceed the 1942 total. Since infestations for that year were the lowest on record for this forest, insect damage during the biennium reached the point where measurements ceased to be significant.

Losses in lodgepole and white pine resulted from attacks by the mountain pine beetle, Dendroctonus monticolae Hopk. Infestations during the biennium were confined to the lodgepole pine stands on Mammoth Lakes recreational areas and were greatly reduced from former status.

Similar conditions prevailed in the broad-leaf types, principally aspen and birch, on the many camp sites where these species occur. Damage to aspen by the aspen leaf roller, Archips sp., common in late years was currently inconspicuous and previously defoliated trees had largely recovered.

Due to an abrupt decline in the population of the Great Basin tent caterpillar, Malacosoma fragilis Stretch, infestations were sustained on a much reduced scale as compared to former years. The principal hosts of this caterpillar on the Inyo ranges are bitter brush, wild gooseberry and desert peach, which are also the principal browse shrubs. Damage is caused by the caterpillars feeding on the leaves. Severe defoliation of these shrubs usually results in their death. Replacement of dead bushes by seedlings is a slow process in this arid region so that even moderate losses result in great impairment of the ranges for long periods. During the early period of the season when large colonies of newly active caterpillars were generally numerous on bitter brush, epidemic conditions appeared imminent. However, the expected epidemic did not develop and according to information received from A. Faussett of the Supervisor's staff, it was prevented by climatic conditions. He reported to the writer that following a severe freeze on the night of May 6, unprecedented mortality developed in the colonies which greatly reduced the caterpillar population. During the balance of the season active colonies were widely scattered and consisted of only a few caterpillars each. The resultant defoliations were minor and caused a very low incidence of range damage.

Measured and estimated losses.

Annual loss estimates for the commercial forests of Jeffrey pine are based primarily on check plots and roadside strips located in representative stands. A tabulation of the measurements secured on these sample plots is shown in Table 2. These basic data were tempered by counts of faded trees occurring on the areas examined.

Table 2. Summary of Jeffrey pine losses on check plots in 1942 and 1943

		Complete loss in 1942		Partial loss in 1943	
Type of sample	Total acres	Total Volume BM	Average loss per A	Total Volume BM	Average loss per A
Check plots	750	6,420	9 b.f.	4,600	6 b.f.
Roadside strips	196	4,740	24 b.f.	3,920	20 b.f.
Total	946	11,160		8,520	
Av. loss per acre			12 b.f.		9 b.f.

Loss estimates for the recreational areas were mainly based on reconnaissance travel through these areas and on special examination of local units. The complete loss record for 1942 and the loss estimate for 1943 (partial record) are summarized in Tables 3 and 4.

Table 3. Estimated Jeffrey pine losses in commercial stands.

Unit	Timb'd acres	Loss in 1942 (complete) No.of trees	Loss in 1942 (complete) Volume MBM	Loss in 1943 (Partial) No.of trees	Loss in 1943 (Partial) Volume MBM
Crestview	11,500	70	55	60	45
Glass Creek	8,500	75	60	55	40
Casa Diablo	12,000	100	100	80	80
Mammoth Lakes	13,000	80	65	60	50
Chidago	5,000	40	20	30	15
Totals	50,000	365	300	285	230

Table 4. Estimated lodgepole and white pine losses on recreational areas.

Area	Timb'd acres	Loss in 1942 (complete) No.of Trees	Loss in 1942 (complete) Volume MBM	Loss in 1943 (Partial) No.of trees	Loss in 1943 (Partial) Volume MBM
Twin Lakes	4,000	30	9	25	8
Mary's Lake	5,000	60	15	60	15
Hot Creek	1,000	30	5	20	3
Glass Creek	2,000	45	10	40	9
Totals	12,000	165	39	145	35

RECOMMENDATIONS

Infestation conditions found generally this year do not appear sufficiently serious to call for control action. No aggressive infestations developed in any of the stands during the year and there was no indication of an early change in the present low status. The continuance of periodic examinations by local forest officers to detect incipient insect outbreaks is highly recommended.

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